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From: Koch, Kristine
Sent: Friday, April 18, 2014 12:03 PM
To: Bob Wyatt (rjw@nwnatural.com); Jim McKenna (jim.mckenna@verdantllc.com)
Cc: jworonets@anchorqea.com
Subject: Portland Harbor - Spatial scales for sediment PRGs

Bob and Jim - Here is what I was thinking for spatial scales to evaluate each alternative against the PRGs in the FS. This will mostly be used in Section 4 of the FS.

All sediment PRGs will be evaluated within the SDU scale. In addition, sediment PRGs will be evaluated as follows:

RAO 1 – Direct Contact
Beach – Average across beach. In the BHHRA the evaluation was performed on an average beach exposure. Since there is only one value for each beach, if the value exceeds the PRG, then we would assume that some action needs to occur. Sediment – Rolling 0.5 RM average by side of river. In the BHHRA the evaluation was performed on a fixed 0.5 RM along the side of the river. Where there is a 0.5 RM exceedance above the PRG, we would assume that some action needs to occur.

RAO 2 – Fish and Shellfish Consumption
Sediment – Rolling 1 RM average in each river segment (Eastern Nearshore, Western Nearshore, and Navigation Channel). In the BHHRA, several species were evaluated for fish and shellfish consumption. Shellfish evaluated were clams and crayfish, fish included carp, bass, bullhead, and crappie. The home ranges for the species evaluated range from point-by-point to larger than the site, with the nearshore zones providing the most preferential habitat. The spatial scales evaluated for consumption patterns ranged from station (crayfish) to site-wide. Tissue concentrations represent the exposure point. In order to ensure the average tissue concentration from all species consumed is equivalent to or less than the PRG, the average sediment concentrations needs to be at or below the risk-based threshold within the spatial scales of the species' home-range. Because the PRG is based on consumption of a multi-species fish diet (except cPAHs which are based on clam consumption) averaged over a 1 RM scale, protection at that spatial scale was selected (1 RM by side of river, as represented by the smallmouth bass). Bass represent one of the commonly consumed resident fish, although it is not the most contaminated fish. The Navigation Channel is also evaluated at this scale. Other spatial scales may also be looked at in the FS.

RAO 5 – Ingestion & Direct Contact
Sediment – Rolling 0.5 RM average in each river segment (Eastern Nearshore, Western Nearshore, and Navigation Channel). In the BERA, several representative species were evaluated which had spatial scales ranging from point-by-point to 3 RM. EPA selected the spatial scale of the sculpin to represent the spatial scale of this RAO. While many of the PRGs are PECs which are applied point-by-point to protect individuals, this scale is protective at the population scale in Portland Harbor. Since benthic toxicity is also used at this site on a point-by-point basis, which is a direct measurement of toxicity, it is not necessary to apply the PRGs at a point-by-point scale. The Navigation Channel is also evaluated at this scale. Other spatial scales may also be looked at in the FS.

RAO 6 – Biota (Prey) Ingestion
Sediment – Rolling 1 RM average in each river segment (Eastern Nearshore, Western Nearshore, and Navigation Channel). In the BERA, several representative species were evaluated which had spatial scales ranging from 0.5 RM to site-wide. Some species forage only on the sides of the river while others forage across the river. In order to select a spatial scale protective of all species, the scale of the mink and smallmouth bass was selected as the representative spatial scale. The Navigation Channel is also evaluated at this scale. Other spatial scales may also be looked at in the FS.

Let me know if you need to discuss further.

Regards,

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